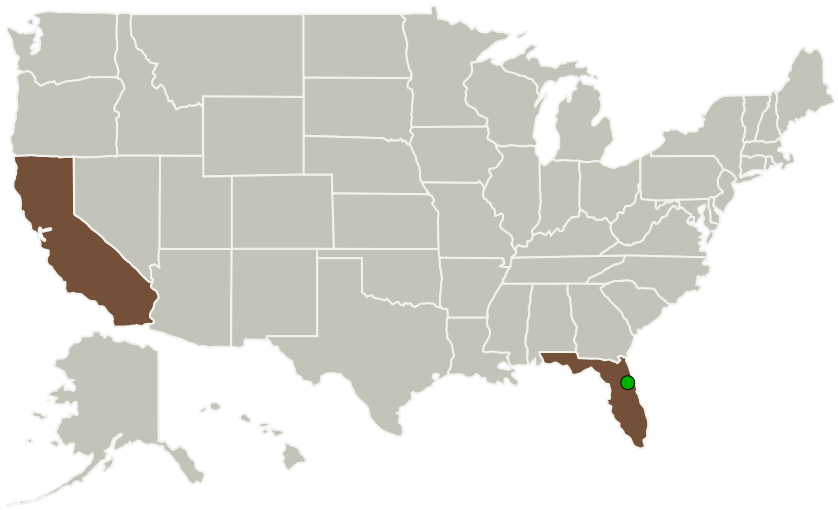
Platform Independent Launch Vehicle Avionics with GPS Metric Tracking, Phase II

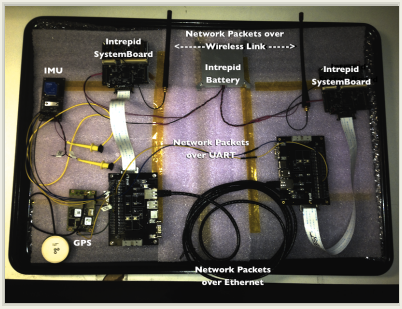
Completed Technology Project (2014 - 2016)

Project Introduction

For this award, Tyvak proposes to develop a complete suite of avionics for a Nano-Launch Vehicle (NLV) based on the architecture determinations performed during Phase I. This system will address the unique avionics challenges of a dedicated small launch vehicle and will utilize heritage and lessons learned from Tyvak's CubeSat avionics systems, modifying and optimizing its existing products for use with this new class of launch vehicles. The major technical objectives are: - Provide broad compatibility with all known NLV systems in development - Determine and provide appropriate performance and reliability metrics while maintaining the low-cost/low-mass approach made possible by commercial electronic systems - Implement the latest network protocols with support for wireless systems in the NLV environment - Develop a GPS metric tracking system and perform requirement verification to meet range safety recommendations - Demonstrate the reliability of low-cost/low-mass/low-power/redundant automatic flight termination system (AFTS) by combining the latest generation of commercial miniature GPS systems with high performance computer systems currently used by Tyvak - Validate functionality and performance for the entire NLV avionics suite through a series of incremental tests, from vibration and thermal vacuum, through a stratospheric balloon flight, an inert test article flight, to final demonstration on a NLV proxy.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Tyvak Nano-Satellite Systems Inc.	Lead Organization	Industry	Irvine, California
Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida

Primary U.S. Work Locations	
California	Florida

Project Transitions

April 2014: Project Start

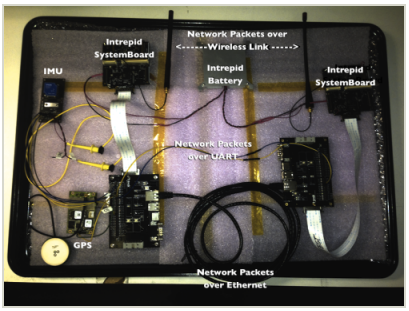
April 2016: Closed out

Closeout Summary: Platform Independent Launch Vehicle Avionics with GPS Metric Tracking, Phase II Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/137750)*

Images



Briefing Chart Image
Platform Independent Launch Vehicle Avionics with GPS Metric Tracking, Phase II *(https://techport.nasa.gov/image/132489)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Tyvak Nano-Satellite Systems Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

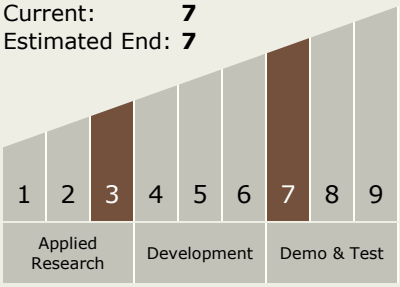
Carlos Torrez

Principal Investigator:

Austin Williams

Technology Maturity (TRL)

Start: **3**
Current: **7**
Estimated End: **7**



Platform Independent Launch Vehicle Avionics with GPS Metric Tracking, Phase II

Completed Technology Project (2014 - 2016)

Final Summary Chart Image
Platform Independent Launch Vehicle Avionics with GPS Metric Tracking, Phase II Project Image *(https://techport.nasa.gov/image/131936)*

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.3 Flexible Material Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System